

AI CROP DISEASE DETECTION

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ABSTRACT

The rapid growth of technology in agriculture has created new opportunities to improve crop productivity and reduce losses caused by diseases. Crop diseases are one of the major challenges faced by farmers, leading to significant reduction in yield and quality. Early detection and proper diagnosis of these diseases are essential for effective treatment and prevention.

This project, titled “AI Crop Disease Detection System”, aims to develop a web-based application that uses Artificial Intelligence to identify crop diseases from images. The system allows users to upload images of infected crop leaves through a simple and user-friendly interface. The uploaded image is processed using an AI-based model, which analyzes the image and predicts the type of disease.

The backend of the system is developed using Python Flask, which handles image processing, model prediction, and server-side operations. The frontend is designed using HTML, CSS, and JavaScript to provide an interactive user experience. The system uses MySQL database to store user information, uploaded images, and prediction results.

I. INTRODUCTION

The AI Crop Disease Detection System is designed to improve agricultural productivity through intelligent disease prediction and image analysis. Farmers often face serious challenges due to late disease identification, poor treatment methods, and lack of agricultural expertise in rural areas. The use of Artificial Intelligence and Deep Learning technologies enables fast and accurate prediction of crop diseases from leaf images.

The proposed system uses image processing techniques, Convolutional Neural Networks, and web technologies to provide a complete smart farming solution. Users can

upload crop images through a user-friendly interface, and the trained AI model analyzes the images to identify disease patterns. The system provides prediction results, disease details, prevention methods, and treatment suggestions.

The application is developed using Python Flask for backend processing, HTML, CSS, and JavaScript for frontend development, and MySQL for secure data management. The system architecture follows a layered design approach that improves scalability, maintainability, and performance. The project demonstrates practical implementation of Artificial Intelligence in agriculture and supports modern digital farming practices.

The AI-based system reduces dependency on agricultural experts and minimizes manual effort required for disease identification. Real-time disease detection helps farmers take preventive action quickly and avoid crop damage. The use of Deep Learning models improves prediction accuracy and supports efficient crop management.

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II. LITERATURE REVIEW

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Modern agriculture requires smart technological solutions to improve food production and reduce economic losses caused by crop diseases. AI-powered disease detection systems can significantly improve farming efficiency and contribute toward sustainable agriculture development. The project also creates opportunities for future enhancements such as IoT integration, mobile applications, cloud-based monitoring, and real-time camera-based prediction systems.

III. PROBLEM STATEMENT

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IV. OBJECTIVES OF THE PROJECT

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V. EXISTING SYSTEM

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VI. PROPOSED SYSTEM

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VIII. DATABASE DESIGN

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IX. MODULE DESCRIPTION

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X. IMPLEMENTATION

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XI. TESTING AND RESULTS

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XII. ADVANTAGES OF THE SYSTEM

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XIII. LIMITATIONS OF THE SYSTEM

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XIV. ROLE OF AI IN AGRICULTURE

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XV. CONCLUSION

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